Tuna Newsletter

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- Southwest Region
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U.S. TUNA STATISTICS

Editor's note: The following articles were prepared by NMFS personnel from data and information gathered from sources in the U.S. tuna industry. (A. Jackson)

U.S. CANNED TUNA INDUSTRY HIGHLIGHTS, FOURTH QUARTER 1990

Total receipts of tuna by U.S. canners during the fourth quarter of 1990 (October-December) decreased by 23% to 98,900 short tons (st) compared to the fourth quarter 1989 (Table 1). Receipts in Puerto Rico and in California and American Samoa were down by 36% and 7%, respectively. Receipts of yellowfin tuna in Puerto Rico were down by 55%, largely a

Table 1. U.S. cannery receipts (st) of domestic and imported tuna by species for the fourth quarters of 1989, 1990 and the recent (1985-89) fourth quarter averages. Totals may not add due to rounding.

SPECIES		Albacore	Skipjack	Yellowfin[1]	TOTAL
AMERICAN SAMOA & CALIFORNIA					
1989	DOMESTIC	200	14,600	22,400	37,200
	IMPORTED	4,500	7,200	9,900	21,600
	TOTAL	4,700	21,800	32,300	58,800
1990	DOMESTIC	400	27,400	11,500	39,300
	IMPORTED	4,500	8,400	2,700	15,600
	TOTAL	4,900	35,800	14,200	54,900
1985-89 Average	DOMESTIC	600	19,300	13,500	33,400
	IMPORTED	4,600	6,700	5,100	16,400
	TOTAL	5,200	26,000	18,600	49,800
PUERTO RICO					
1989	DOMESTIC	600	2,300	13,200	16,100
	IMPORTED	16,700	20,600	15,700	53,000
	TOTAL	17,300	22,900	28,900	69,100
1990	DOMESTIC	0	4,900	7,300	12,200
	IMPORTED	14,900	11,100	5,800	31,800
	TOTAL	14,900	16,000	13,100	44,000
1985-89 Average	DOMESTIC	700	5,600	16,900	23,200
	IMPORTED	18,800	21,300	13,200	53,300
	TOTAL	19,500	26,900	30,100	76,500
TOTAL					
1989	DOMESTIC	900	16,900	35,600	53,400
	IMPORTED	21,200	27,800	25,500	74,500
	TOTAL	22,100	44,700	61,100	127,900
1990	DOMESTIC	400	32,200	18,900	51,500
	IMPORTED	19,400	19,500	8,500	47,400
	TOTAL	19,800	51,700	27,400	98,900
1985-89 Average	DOMESTIC	1,300	25,000	30,400	56,700
	IMPORTED	23,400	28,000	18,300	69,700
	TOTAL	24,700	53,000	48,700	126,400

[1]Includes small amounts of bigeye and blackfin tuna.

Table 2. U.S. cannery imports (st) of tuna by species[1] and flag of catcher vessel for the fourth quarter of 1990. Totals for the fourth quarter of 1989 are given for comparison. Totals may not add due to rounding.

COUNTRY	1990				1989
	ALB	SKJ	YFT[2]	TOTAL	TOTAL
AUSTRALIA	0	600	*	600	0
BRAZIL	*	1,200	*	1,200	2,400
ECUADOR	0	700	1,400	2,100	4,500
FIJI	0	0	*	*	200
FRANCE	0	200	0	200	6,500
GHANA	0	5,700	2,000	7,700	8,700
JAPAN	1,200	1,200	1,000	3,400	3,400
SOUTH KOREA	1,300	3,800	1,600	6,700	6,100
SPAIN	0	2,700	700	3,400	1,400
TAIWAN	16,900	2,300	400	19,600	20,200
TONGA	*	*	*	100	100
VANUATU	0	400	500	900	4,400
VENEZUELA	0	400	700	1,100	5,300
OTHER	0	0	0	0	11,500
UNKNOWN	0	300	0	300	0
TOTAL (AS RECEIVED)	19,400	19,500	8,500	47,400	74,500
TOTAL (RND WT BASIS)[3]	19,500	27,000	9,300	55,800	75,500

*Less than 100 st reported for this category.

[1]ALB=albacore; SKJ=skipjack; YFT=yellowfin.

[2]Includes small amounts of bigeye and blackfin tuna.

[3]Converted to round weight by using factors of 1.11 for gilled and gutted, 1.25 for dressed, 1.3 for headless and 2.25 for loin.

Table 3. Receipts (st) of tuna by U.S. canneries by species[1] and area of capture for the fourth quarters of 1989 and 1990. Totals may not add due to rounding.

SOURCE	1989			1990		
	ALB	SKJ	YFT[2]	ALB	SKJ	YFT[2]
E. ATLANTIC OCEAN						
DOMESTIC	0	0	0	0	0	0
IMPORTED	6,100	7,400	1,300	8,900	8,400	3,800
TOTAL	6,100	7,400	1,300	8,900	8,400	3,800
W. ATLANTIC OCEAN						
DOMESTIC	0	0	0	0	0	0
IMPORTED	2,700	2,400	100	4,500	1,600	600
TOTAL	2,700	2,400	100	4,500	1,600	600
E. PACIFIC OCEAN						
DOMESTIC	700	4,200	19,800	400	2,600	5,300
IMPORTED	0	5,200	17,100	0	1,200	2,100
TOTAL	700	9,400	36,900	400	3,800	7,400
W. PACIFIC OCEAN						
DOMESTIC	100	12,600	15,800	0	29,600	13,600
IMPORTED	6,400	5,800	6,100	5,000	7,200	2,100
TOTAL	6,500	18,400	21,900	5,000	36,800	15,700
INDIAN OCEAN						
DOMESTIC	0	0	0	0	0	0
IMPORTED	5,900	7,000	900	1,000	1,200	0
TOTAL	5,900	7,000	900	1,000	1,200	0

[1]ALB=albacore; SKJ=skipjack; YFT=yellowfin.

[2]Includes small amounts of bigeye and blackfin tuna.

result of the U.S. canners' decision to buy only "dolphin safe" tuna. Skipjack tuna was the principal component of all domestically caught deliveries at 32,200 st, followed by yellowfin (18,900 st) and albacore (400 st). Domestic deliveries narrowly led imports with 52% of the total. Skipjack was the leading import at 19,500 st, followed by albacore (19,400 st) and yellowfin (8,500 st). The leading non-U.S. supplier was Taiwan, with 41% of the import market, followed by Ghana and South Korea with 16% and 14%, respectively, of the market (Table 2). The western Pacific Ocean was the main source of skipjack (36,800 st) and yellowfin (15,700 st) in U.S. cannery receipts, while the eastern Atlantic produced the greatest quantity of albacore (8,900 st, Table 3). The vast majority of tuna receipts by U.S. canners are of whole fish (round). However, some quantity of tuna are received gilled and gutted, dressed, headless, or as loins. After conversion to round weight, U.S. cannery receipts for the fourth quarter of 1990 totaled 108,200 st, down 16% from the 1989 fourth quarter total (Table 4).

Contract prices for domestically caught tuna delivered to U.S. canners in American Samoa were higher than fourth quarter 1989 prices for small fish (less than 7.5-lb.), unchanged for fish in the 7.5- to 20-lb. category, and $80 to $180 per st lower for yellowfin weighing over 20 pounds. No contract prices exist for domestic deliveries to Puerto Rico for fourth quarter 1989. (Table 5).

U.S. imports of canned tuna packed in water totaled 23,800 st for the fourth quarter of 1990, down 13% from the fourth quarter 1989 total. Wholesale list prices for canned tuna during this period were mixed: prices for white meat were slightly higher ($52-$67.15/case); the price for light meat, advertised label was down ($40-$43.50/case);

Table 4. Total U.S. cannery receipts (st) by classification of tuna as received by packers for the fourth quarters of 1989 and 1990. Totals may not add due to rounding.

SPECIES		Albacore	Skipjack	Yellowfin[1]	TOTAL
1989	ROUND	22,100	44,600	59,600	126,300
	G & G	0	0	700	700
	DRESSED	0	0	*	*
	LOIN	0	100	900	1,000
	HEADLESS	0	0	*	*
	TOTAL (AS RECEIVED)	22,100	44,700	61,100	127,900
	TOTAL (RND WT BASIS)[2]	22,100	44,800	62,400	129,300
1990	ROUND	19,300	45,600	25,300	90,200
	G & G	0	*	1,400	1,400
	DRESSED	0	0	0	0
	LOIN	500	6,200	700	7,400
	HEADLESS	0	0	0	0
	TOTAL (AS RECEIVED)	19,800	51,700	27,400	98,900
	TOTAL (RND WT BASIS)[2]	20,400	59,500	28,400	108,200

*Less than 100 st reported for this category.

[1]Includes small amounts of bigeye and blackfin tuna.

[2]Converted to round weight by using factors of 1.11 for gilled and gutted, 1.25 for dressed, 1.3 for headless and 2.25 for loin.

Table 5. Contract prices (U.S. $ per st) for skipjack and yellowfin tuna for delivery to U.S. canneries in American Samoa and Puerto Rico by U.S. vessels departing on trips in fourth quarter 1989 and 1990. Note: No contract prices exist for fourth quarter 1990 for deliveries in Puerto Rico.

SIZE CLASS (lbs.)	SKIPJACK		YELLOWFIN	
	1989	1990	1989	1990
American Samoa				
<3	365-390	420	365-390	420
3 to 4	585-610	620	585-610	620
4 to 7.5	790-815	820	790-815	820
7.5 to 20	875-900	895	900-925	910
>20			1,090-1,115	985-1,010
Puerto Rico				
<3	365-390	*	365-390	*
3 to 4	585-610	*	585-610	*
4 to 7.5	790-815	*	790-815	*
7.5 to 20	875-900	*	900-925	*
>20			1,090-1,115	*

Table 6. Wholesale list price (U.S. $ per case) for canned tuna packed in oil or water, by brand type, for the fourth quarters of 1989 and 1990.

CASE PACK	YEAR	ADVERTISED LABEL	PRIVATE LABEL
White meat, solid 12.5-oz (24)	1989	64.50-65.00	50.00-52.00
	1990	64.50-67.15	52.00-54.00
Light meat, chunk 6.5-oz (48)	1989	42.45-45.00	25.00-27.00
	1990	40.00-43.50	25.00-26.50

and the price for light meat, private label was practically unchanged ($25-$26.50/case)(Table 6).

U.S. CANNED TUNA INDUSTRY, TOTAL RECEIPTS UPDATE

Total receipts of tuna by U.S. canners for 1990 decreased by 23% to 410,400 st, compared to the total for 1989 (Table 7). Deliveries of yellowfin and skipjack were down (33% and 22%, respectively); deliveries of albacore were down 7%. However, in round weight, the decrease in receipts was less severe, with total receipts down just 17% (Table 8). In 1990 there was nearly an eightfold increase in the amount of tuna loins received by U.S. canners.

1991 U.S. imports of canned tuna packed in water totaled 62,900 st as of April 14, up 10% from the total for the same period in 1990.

U.S. TUNA FISHERIES UPDATE

EASTERN PACIFIC PURSE SEINE FISHERY

In 1990, 31 U.S. purse seiners caught an estimated 52,900 metric tons (mt) of yellowfin tuna and 11,600 mt of skipjack tuna in the eastern tropical Pacific (Figure 1). The yellowfin catch was down 30% from the 1989 catch (75,900 mt),

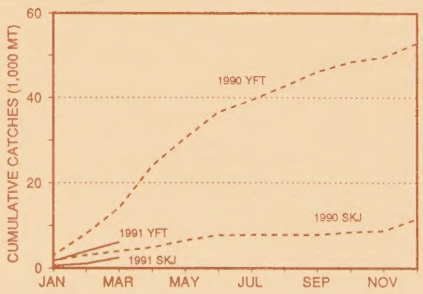

Figure 1. Cumulative tuna catches, by month, for the U.S. eastern Pacific purse seine fishery, 1990 and 1991.

Table 7. U.S. cannery receipts (st) of domestic and imported tuna by species for 1989, 1990 and the recent (1985-89) averages. Totals may not add due to rounding.

SPECIES		Albacore	Skipjack	Yellowfin[1]	TOTAL
1989	DOMESTIC	4,900	103,000	117,300	225,200
	IMPORTED	96,500	126,400	86,200	309,100
	TOTAL	101,400	229,400	203,500	534,300
1990	DOMESTIC	6,900	95,500	92,500	194,900
	IMPORTED	87,900	83,700	43,900	215,500
	TOTAL	94,900	179,200	136,400	410,500
1985-89 Average	DOMESTIC	5,100	98,300	127,700	231,100
	IMPORTED	100,800	107,000	73,500	281,300
	TOTAL	105,900	205,300	201,200	512,400

[1]Includes small amounts of bigeye and blackfin tuna.

Table 8. Total U.S. cannery receipts (st) by classification of tuna as received by packers for 1989 and 1990. Totals may not add due to rounding.

SPECIES		Albacore	Skipjack	Yellowfin[1]	TOTAL
1989	ROUND	101,400	228,900	197,700	528,000
	G & G	0	0	2,500	2,500
	DRESSED	0	0	*	*
	LOIN	0	500	3,300	3,800
	HEADLESS	0	0	*	*
	TOTAL (AS RECEIVED)	101,400	229,400	203,500	534,300
	TOTAL (RND WT BASIS)[2]	101,400	230,100	208,000	539,400
1990	ROUND	87,200	160,500	126,800	374,500
	G & G	0	*	5,700	5,700
	DRESSED	0	0	0	0
	LOIN	7,600	18,700	3,800	30,100
	HEADLESS	0	0	0	0
	TOTAL (AS RECEIVED)	94,900	179,200	136,400	410,500
	TOTAL (RND WT BASIS)[2]	104,400	202,600	141,900	448,800

*Less than 100 st reported for this category.

[1]Includes small amounts of bigeye and blackfin tuna.

[2]Converted to round weight by using factors of 1.11 for gilled and gutted, 1.25 for dressed, 1.3 for headless and 2.25 for loin.

and the skipjack catch was down 46% from the 1989 catch (21,400 mt). The lower catches in 1990 are largely the result of a decrease in the size of the U.S. fleet, in part a response to the decision by U.S. canners in April to buy only "dolphin safe" tuna or tuna caught in a manner that does not involve dolphin. By the end of the year, the number of active U.S. purse seiners in the eastern Pacific fell to 17.

During the period January through March 1991, 12 U.S. purse seiners caught an estimated 6,100 mt of yellowfin tuna and 2,500 mt of skipjack tuna. The yellowfin catch was down 57% from the 1990 catch (14,100 mt) for the same period, and the skipjack catch was down 39% from the 1990 catch (4,000 mt).

WESTERN PACIFIC PURSE SEINE FISHERY

In 1990, 40 U.S. purse seiners landed an estimated 105,800 mt of skipjack tuna and 52,000 mt of yellowfin tuna in the western Pacific under the South Pacific Regional Tuna Treaty (Figure 2). The skipjack catch was up 17% from the 1989 catch (90,400 mt) and the yellowfin catch was up 26% from the 1989 catch (41,200 mt).

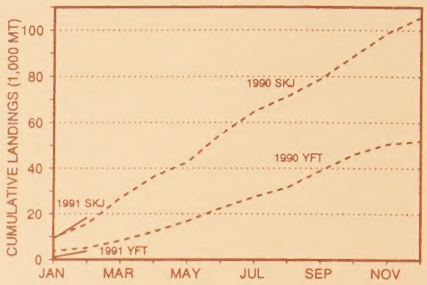

Figure 2. Cumulative tuna landings, by month, for the U.S. western Pacific purse seine fishery, 1990 and 1991.

During the period January through February 1991, 22 U.S. purse seiners caught an estimated 18,300 mt of skipjack tuna and 3,600 mt of yellowfin tuna from the western Pacific. The skipjack catch was up 18% from the 1990 catch (15,500 mt) for the same period, and the yellowfin catch was down 29% from the 1990 catch (5,100 mt).

NORTHERN PACIFIC ALBACORE FISHERY

The 1990 U.S. north Pacific albacore catch, with all but a very few landings yet to be reported, stands at 2,800 mt. This is up from the all-time low of 1,900 mt recorded for the 1989 season. Over 400 vessels participated in the 1990 fishery. Additionally, approximately 75 Canadian vessels landed 300 mt during 1990.

Albacore catch rates in the north Pacific improved in 1990 to an estimated 37 fish per day from the 29 fish per day recorded for 1989. Average albacore weight increased to 7.5 kg, compared to 5.7 kg in 1989.

SOUTHERN PACIFIC ALBACORE FISHERY

The 1990-91 U.S. south Pacific albacore season began in late November 1990 and continued into April 1991. Over 60 vessels participated in the fishery, with the total catch expected to exceed 6,000 mt. Catch rates have been similar to those of the previous season, al-

though catches have tended to be spotty and less consistent than in 1989-90.

ATLANTIC BLUEFIN TUNA FISHERY

The U.S. Atlantic bluefin tuna fishery is regulated with an ICCAT annual catch quota of 1,387 mt. As of April 4, the total commercial landings for 1991 stood at 108 mt, down 21% from the 1990 landings (136 mt) for the same period. (Data provided by Ann Favazza, NMFS Northeast Region)

Gary Rensink and John Childers, SWFSC, contributed to this article.

REPORTS

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STATUS OF WORLD YELLOWFIN TUNA FISHERIES AND STOCKS

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Introduction

During the past quarter century, total production of commercially important tunas (southern bluefin, northern bluefin, albacore, bigeye, yellowfin and skipjack) nearly doubled from 1 million tons (metric tons) in 1965 to about 2 million tons in 1988, the increases mainly coming from the purse seine fisheries for yellowfin and skipjack. It is the yellowfin stocks harvested by purse seine fisheries for which the increase in catches is a cause for concern.

The possibility that yellowfin stocks might be overfished was actually raised as early as the mid-1960s for both the eastern Pacific and eastern Atlantic stocks. It became apparent, however, that the increase in catches over the years was the result of expansion of the fishing grounds to offshore areas and the introduction of various technological innovations. Sustainable catches for the eastern Pacific and eastern Atlantic yellowfin stocks now appear much higher than formerly estimated.

World fisheries for yellowfin tuna have developed rapidly through a series of innovative changes. Previously, the species had been taken mainly by the Japanese longline fishery and, to a much lesser degree, by artisanal coastal fisheries in the western Pacific and western Indian oceans. In the western Pacific in the mid-1970s, Japanese fishermen found that yellowfin and skipjack schools that associate with drifting objects (mainly logs) could be captured by purse seining. This led to a revolutionary change there to purse seining for tropical tunas. This development was comparable to the earlier discovery of the efficiency of purse seining for dolphin-associated yellowfin schools in the eastern Pacific, which revolutionized the eastern Pacific fishery. In the western Indian Ocean, the change came in the early 1980s, when Spanish and French tuna fishermen initiated experimental surface fishing there, seemingly in search for substitutes for the already heavily exploited eastern Atlantic yellowfin stock. World production of yellowfin by purse seine fishing soon outgrew the production by longlining.

In the following sections of this report, the fisheries and status of stocks of yellowfin, and topics pertinent to each, are briefly described.

Eastern Pacific

This stock has long been closely monitored by the Inter-American Tropical Tuna Commission (IATTC). The surface fishery here developed from an earlier baitboat fishery which transformed to the modern purse seine fishery at the end of the 1950s. Technological improvements to purse seining followed, along with expansion of the fishing grounds to offshore areas and the development of techniques to catch dolphin-associated yellowfin schools. Both fishing effort and catch increased rapidly from the late 1960s to the mid-1970s (Fig. 3--showing yield in short tons). After that period, the fishery appeared to be operating on the overfishing side of the surplus production curve. A drastic change occurred, beginning in 1983, when substantial numbers of purse seiners left the eastern Pacific for the western Pacific. The low catch rates in the eastern Pacific that triggered this departure were associated with the occurrence there of one of the strongest El Niño events in this century. Fishing effort was reduced by nearly half, and the catch also decreased sharply. Fishing effort has remained more or less constant since 1983, and therefore it was anticipated that catches would increase again. This recovery did occur, but the catches from 1986 onwards were much higher than expected according to the production model (Fig. 3). Maximum sustainable yield (MSY), as indicated by the model with data for recent years included, would appear to be much higher than estimated before. The reasons for the higher yields are now attributed to increases in recruitment and yield-per-recruit, the latter resulting from catching bigger fish.

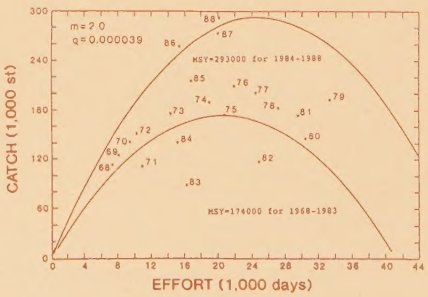

Figure 3. Relationship between fishing effort and catch for the yellowfin fishery in the eastern Pacific (inside the CYRA), from 1968 to 1988 (IATTC Annual Report for 1988).

Western Pacific

Total catch of yellowfin in 1987 from the western Pacific (FAO area 71, roughly 20°N-25°S and west of 175°W) is about 250 thousand tons, comparable to that of the eastern Pacific stock (Fig. 4). There are three major types of fishing gears used in yellowfin fisheries in this area: longlining, purse seining, and the various artisanal methods. Japan, U.S., Philippines and Indonesia are the major fishing countries.

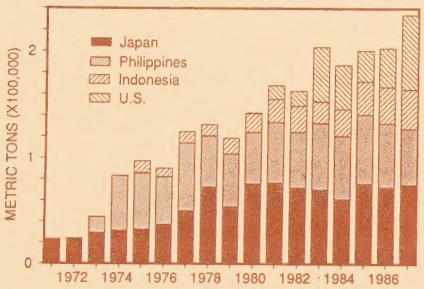

Figure 4. Yellowfin tuna catch in metric tons by major fishing countries in the western Pacific (FAO Area 71).

Longlining is still an important traditional fishery for Japan, but the relative importance, in terms of catch, between the Japanese longline and Japanese purse seine fisheries has been reversed. Since 1983, the purse seine catch has exceeded that of the longline catch for most of the years. As mentioned earlier, purse seining in the western Pacific heavily depends on log-associated schools.

The U.S. catch, shown in Figure 4, is taken by the U.S. purse seine fishery, and is the highest among the purse seining countries. The U.S. became a major fishing country in the western Pacific after the 1983 influx of U.S. purse seiners from the eastern Pacific.

Other fisheries also contribute substantially to total production from the area. Although not shown, Korean and Taiwanese purse seine catches of yellowfin have been increasing; their combined catch of yellowfin was about 20 thousand tons in 1988 (SPC Regional Tuna Bull.) Artisanal/coastal fisheries also produce substantial yellowfin catches, especially in the Philippines and Indonesia. These fisheries depend on payaos (fish aggregating devices). Their major fishing gears are, in the Philippines, purse seine, ringnet (small scale purse seine) and handline; and, in Indonesia, purse seine, baitboat, gillnet, and handline.

Status of the western Pacific yellowfin stock remains mostly unknown, mainly due to lack of a common database covering the entirety of the fisheries. However, there is indication from the catch per unit of effort (CPUE) trend of yellowfin in the Japanese longline fishery that, by the mid-1980s, a moderate decline of the stock to about one half of that at the beginning of the fishery had occurred (Fig. 5). There is some variation in the declining trend of CPUE after 1976, but this cannot be simply attributed to the rapidly developing catches by purse seiners; the decline started before those surface catches had become significant. Moreover, the longline CPUE appears not to show further decline after 1983, when the purse seine catch became substantial.

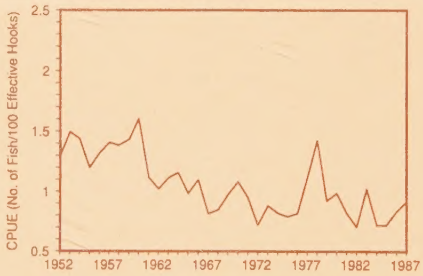

Figure 5. Trend of CPUE for yellowfin tuna caught by the Japanese longline fishery in the western Pacific.

At present, there is no reliable CPUE series for the western Pacific surface purse seine fisheries to reflect changes in stock abundance; the CPUE based on nominal fishing effort by the Japanese boats shows no consistent increasing or decreasing trend. In this regard there is evidence that the CPUE derived from fishing on free swimming schools is a valid indicator of the CPUE for the entire purse seining operations. In the eastern Pacific and eastern Atlantic purse seine fisheries, it has been noted that environmental conditions, especially depth of the thermocline, have a large influence on fishing efficiency of the purse seine fleet. Plots of the Southern Oscillation Index (which monitors the conditions associated with El Nino events) against CPUE of the Japanese purse seine fishery suggest an inverse correlation (Fig. 6). This indicates the importance of accounting for environmental conditions in developing a reliable CPUE index from the surface fishery.

The Philippine fishery is one of the most important of the component fisheries that must be considered in assessing the western Pacific stock. In this regard, the

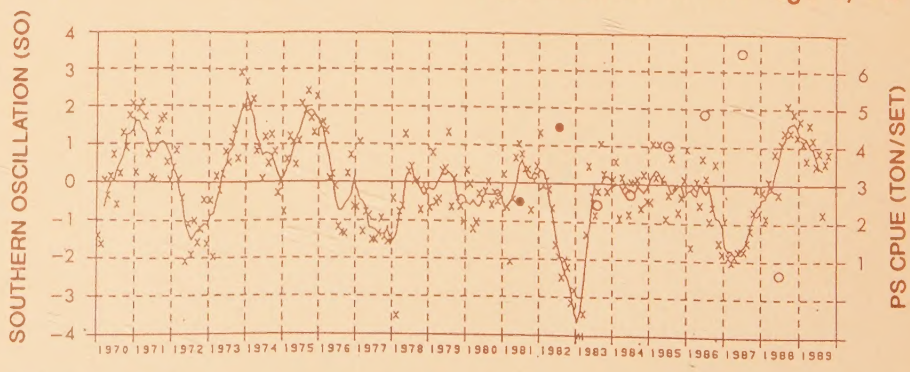

Figure 6. Comparison of the Southern Oscillation Index and yellowfin CPUE for free swimming schools taken by the Japanese purse seine fishery. Open and solid circles denote the CPUE of fish above 10 kg and 20 kg, respectively. Cross signs show standard deviations of the observed Southern Oscillation Index (the smoothed values are shown by the curve).

Indo-Pacific Tuna Development and Management Programme (IPTP), under United Nations assistance, has been collecting the basic fisheries statistics for more than 10 years. Detailed catch/effort and size measurement data are available from 1980 onwards. Preliminary analyses of the Philippine data show several aspects of interest concerning the yellowfin stock in this region. Very small yellowfin, ranging from 20 to 30 cm, are dominant in the coastal ringnet fishery, while the handline fishery takes both small fish (40-60 cm) and very large fish (130-160 cm). There is a general lack of middle sized fish (60-120 cm) which, in fact, are taken in the offshore, eastern part of the western Pacific by the industrial purse seine and longline fisheries. This and recent tagging experiments, by Tohoku National Fisheries Research Institute, indicate that the yellowfin in the western Pacific probably belong to a single stock. Fish tagged and released in far offshore areas were recovered in Philippine coastal areas.

Fishing performance of the major yellowfin fisheries of the western Pacific has been fairly good to date; catches have been sustained in recent years. Various circumstantial information indicates that the stock is probably healthy.

Eastern Atlantic

The yellowfin fisheries in the eastern Atlantic followed a development similar to that of the eastern Pacific. However, the surface fisheries here were preceded by a longline fishery that had become substantial by the mid 1960s. The MSY estimated in the early 1970s (about 60 thousand tons) was nearly doubled in the late 1970s (Fig. 7), due mainly to expansion of the fishing grounds to offshore areas. As exploitation increased, there began a shift of eastern Atlantic purse seine fleets to the western Indian Ocean. By 1984, this shift was significant and resulted in a marked reduction of eastern Atlantic fishing effort. The resulting catch fell to half that of previous years (Fig. 7). Both catch and CPUE have increased again since the mid 1980s, and the catch is now close to the present estimate of MSY (120 thousand tons).

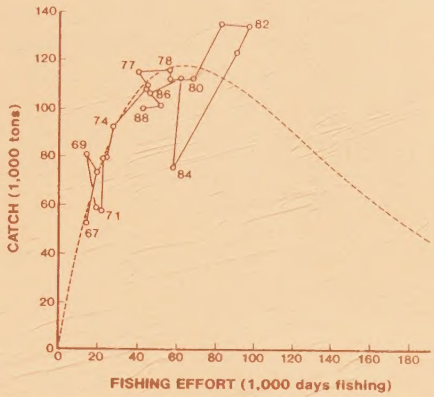

Figure 7. Relationship between fishing effort and catch for the yellowfin fishery in the eastern Atlantic (ICCAT SCRS Report for 1989).

Recent intensive studies under the Yellowfin Year Programme of the International Commission for the Conservation of Atlantic Tunas have demonstrated that the surplus production model does predict the changes in the catch and fishing effort relationship. However, it was also noted that the environment has important influences on the catchability experienced by purse seine boats, hence on observed CPUE.

Western Indian Ocean

The purse seine fishery started quite recently, in 1983, in the western Indian Ocean. Before that, the longline fishery was dominant (Fig. 8). As mentioned previously, the purse seine fishery was recently initiated by the French and Spanish boats from the eastern Atlantic, which moved to the western Indian Ocean in search of more productive fishing grounds. The Indian Ocean purse seine fishery that developed has been very successful. Large amounts of higher valued, big yellowfin tuna are taken.

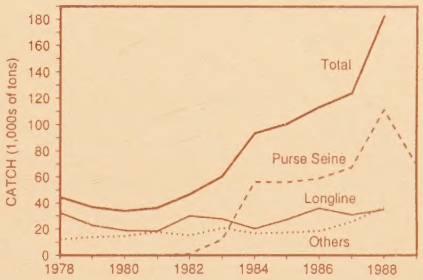

Figure 8. Yellowfin catch in metric tons by major fishing gears in the Indian Ocean.

Like in the western Pacific case, purse seine fishing here appears to so far have had no appreciable adverse effect on the longline fishery, as of 1988. However, both catch and CPUE for the purse seine fishery showed a significant decrease in 1989, despite a smaller fishing effort compared with the previous year. Preliminary analysis suggests that the 1989 anomaly (drop) in the purse seine catch was related to an environment-induced effect and is not a manifestation of overfishing.

Some Comments on the Future

In general, one can note that the condition of yellowfin tuna stocks of the world is good. There is no yellowfin stock for which presently there is serious concern with respect to overfishing. However, lack of a management body with practical binding force in the western Pacific and western Indian Ocean is one serious hazard of the near future. Specifically, the continued increase in the demand for tunas, hitherto absorbed by increased catches from purse seine fishing and the finding of new fishing grounds, will eventually create problems. Previous development of the fisheries resulted in diffusion of fishing effort by transfer of purse seine fleets from the eastern Pacific to the western Pacific and from the eastern Atlantic to the western Indian Ocean. It is obvious that if such uncontrolled increases of regional fishing effort were to continue, especially for the western Pacific yellowfin stock and

to a lesser degree for the western Indian Ocean yellowfin stock, there would inevitably be a destructive impact upon the stocks. It is an open question of how much further the catches of yellowfin from the surface fisheries can be increased and still be sustainable. Additionally, it must be realized that the outlook for finding new fishing grounds elsewhere is dim. At present, only the tuna stocks of the Atlantic, with exception of its circumpolar southern bluefin stock, are under a practical management scheme for effectively dealing with such problems.

The present unsatisfactory situation in management of the yellowfin stocks was noted more than a quarter century ago, and what needs to be accomplished is clear. Both coastal and distant water fishing nations need to discard self-interests regarding exploitation of the highly migratory species and to initiate discussions regarding their rational conservation. Particular emphasis should be placed on sharing of fishing data. This would be a minimum requirement for continuation of fishing. Establishment of a competent management structure in the western Pacific and western Indian Ocean is urgently needed, in particular. Concerted activities among regional management bodies is desirable, given the high mobility of the tuna fishing fleets.

DOLPHIN MORTALITY IN U.S. TUNA FISHERY DECLINES IN 1990

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The estimated number of dolphins killed in the U.S. eastern tropical Pacific tuna purse seine fishery in 1990 was 5,083, down 60% from the estimated 1989 kill of 12,643, according to data collected by onboard observers from the National Marine Fisheries Service (NMFS). The 1990 dolphin kill was well below the allowable annual quota of 20,500, and was the lowest recorded for the U.S. fleet since coming under dolphin regulations in 1972.

The major reasons for the low dolphin kill in 1990 were the reduction in the size of the U.S. fleet in the eastern Pacific and an increase in the fishing effort by the remaining fleet on non-dolphin-associated tuna, both consequences of the U.S. tuna canners' decision in April 1990 to purchase only "dolphin safe" tuna.

In 1990, NMFS observers were on-board 92 U.S. tuna purse seiner fishing trips, and monitored 1,845 sets on dolphins. Forty-four of those trips were observed entirely under the direction of the NMFS while the remainder (48 trips) were observed in cooperation with the Inter-American Tropical Tuna Commission.

The observed dolphin kill-per-set rate in 1990 was 2.8, down 22% from the 1989 rate of 3.6. It was the lowest rate achieved by the U.S. fleet since 1979, when the kill-per-set rate was 2.7 dolphins per set (Figure 9). The dolphin kill-per-ton rate in 1990 was 0.14, down 26% from the 1989 rate of 0.19. This is the lowest per-ton rate on record (Figure 10). The average tuna catch per observed dolphin set in 1990 was 19.1 short tons, virtually the same as in 1989 (Figure 11).

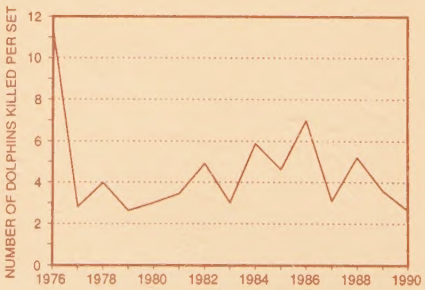

Figure 9. Average number of dolphins killed per set on dolphins for observed U.S. trips, 1976 to 1990.

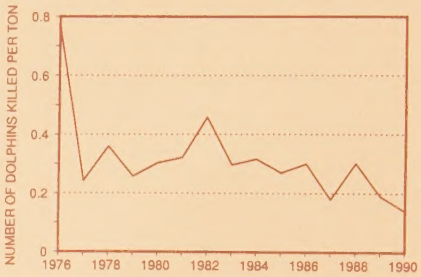

Figure 10. Average number of dolphins killed per ton of tuna caught in dolphin sets for observed U.S. trips, 1976 to 1990.

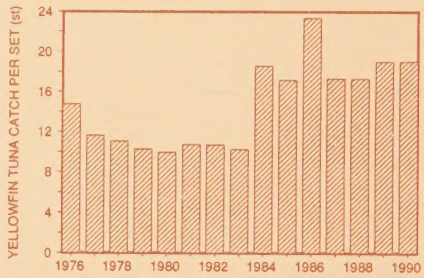

Figure 11. Average tuna catch per set on dolphins for observed U.S. trips, 1976 to 1990.

RECENT DEVELOPMENTS IN TUNA FISHERIES

Editor's note: The following news items, compiled from fishery trade and industry journals, newspapers and NMFS reports, are provided only as a service to our readers. The NMFS does not guarantee their accuracy. (P. Kleiber)

UNITED STATES

San Diego Skipper Captures Golden Porpoise Award--For his record of successful porpoise releases, U.S. tuna purse seiner captain Manuel Jorge of San Diego was recently awarded the 1990 Golden Porpoise Award by the American Tunaboat Association. The Golden Porpoise Award is given to the captain in the U.S. tuna fleet who consistently maintains a high rate of successful porpoise releases during the course of tuna seining opera-

tions in the eastern tropical Pacific. Captain Jorge's performance aboard the vessel *Pamela Ann* was based on government observer reports for seven fishing trips beginning in the fall of 1989 and ending in November of 1990. Captain Jorge posted a successful porpoise release rate of 99.7 percent. (*The Fishermen's News*, March 1991)

Puerto Rico Canneries Closed--By the end of last year, two of Puerto Rico's five tuna canneries had closed and one had reduced operations, putting about 2,000 people out of work. Puerto Rico is the center of the U.S. tuna-packing industry, an $818 million business that at its height employed 8,000 people.

In late July, Bumble Bee's plant in the western city of Mayaguez laid off 800 employees and said it was transferring part of its operations to Santa Fe Springs, California, and to Thailand. In the same month, Van Camp, which cans Chicken of the Sea tuna, closed its plant in Puerto Rico's southern port city of Ponce and said it was moving to Indonesia and American Samoa. Neptune, the sole tuna cannery of the Japanese conglomerate Mitsui, closed its Puerto Rican operations in August. (*World Fishing*, January 1991)

Agreement Between U.S. and France Relating to Fishing in the EEZs of French South Pacific Territories--The Governments of the U.S. and France signed an agreement on March 1, 1991, permitting U.S. vessels to fish in the EEZs of New Caledonia and of Wallis and Futuna, two French territories in the South Pacific. Fishing will take place under the terms and conditions of individual vessel licenses issue by France and of minutes implementing the agreement for the period from November 1, 1991, to October 31, 1992.

During this period, the right to purchase licenses is secured by the payment of an access fee. For the New Caledonian zone, the access fee is $200,000. A maximum of 25 individual vessel licenses may be purchased for the zone, at a cost of $8,000 per vessel. No more than 14 licensed vessels may fish at any time within the zone. For the Wallis and Futuna zone, the access fee is $100,000. A maximum of 7 individual vessel licenses may be purchased for the zone, at a cost of $8,000 per vessel. No more than four vessels may fish at any time within the zone. Since the agreement sets these fees in French francs, dollar figures are approximate. All fees, including access and license fees, are to be paid by the U.S. tuna industry. Also, under the agreement, the U.S. is responsible for collecting fisheries data. (NMFS Office of International Affairs, *Weekly Highlights*, February 25-March 1, 1991)

Moratorium on Hawaiian Longliners--The longline fishery of Hawaii was closed to new entrants for at least three years in early December 1990 when the Western Pacific Fishery Management Council imposed a moratorium by emergency order. The action came as a result of local protests over the recent influx of longliners, swelling the fleet from 45 boats to about 150 in just three years. Details of the moratorium have yet to be worked out, including a firm cutoff date. In the end, as many as a third of the boats could be forced out of the fishery.

The prime species for the longliners are bigeye and yellowfin tuna. Generally favoring the moratorium are longliners who have been in Hawaii for many years, charter-boat owners and recreational fishermen. Opposing the moratorium are recently arrived longliners, including many of Vietnamese ancestry, some of whom claim that the action is specifically directed at them. Earlier attempts to calm the stormy conflict by informal agreement have failed, and both shore and at-sea confrontations have resulted. (*National Fisherman*, February 1991)

Bluefin Recaptured after 14 Years--The Southeast Fisheries Science Center (NMFS) announced that two bluefin tunas that were tagged and released by a purse seiner crew July 16, 1976, were recaptured by handliners 14 years later within 12 days of each other. The area of the tag and release was in the waters off Norfolk, Va. The fish were recaptured offshore of Boston. At tagging, one fish measured 102 cm, the other 106 cm. At recapture, one measured 292 cm and weighed 352 kg, undressed; the other measured 297 cm and weighed 308 kg, dressed. The fish are of interest because of the information they provide about growth rates and the tendency of long-lived species to remain together for such a long time. (*National Fisherman*, April 1991)

SOUTH PACIFIC OCEAN

Taiwan Driftnet Fleet Sightings in South Pacific Decrease--The New Zealand Government announced that sightings of Taiwanese driftnet vessels have decreased during the current albacore tuna season. Government observers on New Zealand tuna vessels have so far sighted only five Taiwanese driftnet vessels in fishing grounds east of New Zealand. This compares with 11 sightings in the summer of 1990 and more than 100 in 1989. It appears that most of the Taiwanese fleet has gone to the Indian Ocean because of unfavorable weather conditions in the South Pacific. (NMFS Office of International Affairs, *Weekly Highlights*, February 25-March 1, 1991)

Palau-Japan Access Negotiations: No Conclusion--The Republic of Palau and Japan failed to reach an agreement on fisheries access at a meeting in Manila, Philippines, in December 1990. Chairman of the Palau Maritime Authority, Mr. Yukio Shmull, said that the diffi-

culties had been in the method of fee payment (Palau retains the lump sum method of payment while Japan favors setting a rate per vessel or per trip) and the recently agreed minimum terms and conditions of access to the EEZs of many South Pacific countries.

Mr. Shmull said that Palau considered the lump sum method to be logical and equitable and that such payments facilitated financial planning in the Republic. Palau was also aware that several of its neighboring countries which have adopted the per vessel system were now contemplating reverting to lump sum. Regarding the minimum terms and conditions, Mr. Shmull said that they had been recommended by the Forum Fisheries Committee and endorsed by the South Pacific Forum. They were considered necessary if the countries were to be able to implement appropriate conservation measures and obtain reasonable benefits for their citizens. Palau was committed to these requirements, said Mr. Shmull, and had made it clear in October that it was not prepared to discuss the matter further. (Forum Fisheries Agency, *News Digest*, January-February, 1991)

Access for EC Vessels to the South Pacific--Following the Forum Fisheries Agency Director's visit to Brussels in September 1990, communication has continued between the European Community and the FFA regarding the possibility of EC vessels gaining access to fish in the waters (South Pacific) of FFA member states. A report was prepared for the Commission of the European Communities by FFA in December 1990 which details existing port facilities, current domestic and foreign fishing activities, and industrial tuna development potential within the region. It is expected that a high level delegation of EC officials and fishing industry representatives will visit the region this year on a fact finding tour. (Forum Fisheries Agency, *News Digest*, January-February, 1991)

INDIAN OCEAN

Seychelles and U.S.S.R. Renew Fisheries Agreement--In 1987, the Seychelles signed a bilateral agreement licensing six Soviet vessels to fish for tuna in its 200-mile zone. It was renewed in 1988 for two years. In December 1990, the two countries, represented by Seychelles Fishing Authority's Managing Director, Philippe Michaud, and the Soviet Fisheries Attache in the Seychelles, Boris Sokolov, renewed this agreement for another two years. From preliminary reports it appears that the provisions of the 1991-92 agreement are similar to those of the 1989-90 agreement. The Soviet vessels will purchase all their supplies, including fuel, in Victoria. They will sell their catch to the Seychelles, as requested, at prices to be determined by both parties. In addition, a Seychellois observer shall be present on each Soviet vessel. Ten new purse seiners are being built in southern Spain for the U.S.S.R. for use in this fishery. (NMFS Office of International Affairs, *Weekly Highlights*, February 25-March 1, 1991, and *World Fishing*, January 1991)

Seychelles-Iran Fisheries Cooperation--Seychelles Agriculture and Fisheries Minister, Jeremie Bonnelame, announced that the Seychelles and Iran are discussing cooperation in fishing and other fields. Mr. Bonnelame and Seychelles Fishing Authority Managing Director, Philippe Michaud, toured fisheries projects in Iran during a visit from September 17-24, 1990, at the invitation of Iran's Minister of Reconstruction. Negotiations are under way to grant tuna fishing licenses to Iranian vessels. Iran has two tuna purse seiners which it would like to deploy off the Seychelles. (NMFS Office of International Affairs, *Latest Developments in African & Middle Eastern Fisheries*, September-December 1990)

Seychelles-EC Fisheries Protocol Signed--The European Community and the Seychelles have signed a new three-year protocol with arrangements for fishing opportunities from January 18, 1990, to January 17, 1993. Under the protocol, 40 EC tuna seiners are authorized to fish in Seychelles waters. In return, the EC will pay a financial compensation of $5.0 million over a period of three years, contribute $2.0 million to the financing of scientific and technical programs and up to $219,000 for practical and training awards. The protocol has been in force on a provisional basis since January last year. (*INFOFISH Trade News*, March 1, 1991)

EASTERN ATLANTIC OCEAN

Sierra Leone-Japan Tuna Agreement Signed--Two Japanese tuna fishing organizations and the Government of Sierra Leone signed a private tuna fishing agreement in Tokyo on November 2. The Japanese organizations are the Federation of Japan Tuna Longliners and the Overseas Purse Seine Fisheries Association. The agreement is valid for one year and went into force during November 1990. The agreement provides for automatic extensions and allows for 20 longliners and two purse seiners to operate off Sierra Leone. Licensing fees for longliners are $2,400 per vessel for 3 months, and $800 per vessel for a 1-month extension. Purse seiner fees are $5,000 per vessel for 3 months, $1,700 per vessel for a 1-month extension. The Japanese hope that this agreement will set a precedent that will help them conclude other agreements with Mauritania, Senegal and Gambia. (NMFS Office of International Affairs, *Latest Developments in African & Middle Eastern Fisheries*, September-December 1990)

Angola-EC Fishery Agreement Finalized--The European Community has finalized a protocol, extending its fisheries agreement with Angola. The agreement covers a two

year period from May 3,1990, to May 2, 1992, and offers fishing opportunities for 24 shrimp trawlers, with a limit of 5,000 mt per year. Licenses are also to be granted for 28 tuna freezer vessels and five tuna purse seiners. In return, the EC will pay a financial compensation of $12.8 million for the two-year period. (*INFOFISH Trade News*, February 18, 1991)

Gambia-EC Three-Year Agreement Concluded--Gambia and the European Community have concluded a three-year fisheries agreement allowing 40 EC freezer vessels, 17 tuna purse seiners and 8 surface longliners access to Gambian waters. The EC also has the option for use of 2,000 GRT trawlers for fresh fish, shrimp and other species. In return for the fishing rights, the EC will pay a financial compensation of $2.94 million in three equal installments. (*INFOFISH Trade News*, February 18, 1991)

Sao Tome-EC Provisional Agreement Ratified--The European Community, on October 22, 1990, ratified a provisional application for fishing rights in Sao Tome. The agreement between the EC and the Government of Sao Tome grants fishing rights to 46 tuna purse seiners and 5 pole-and-line tuna vessels off Sao Tome, with financial compensation to be paid by the EC fixed at $1.18 million. The agreement covers the period from June 1, 1990, to May 31, 1993. (*INFOFISH Trade News*, January 15, 1991)

EC Proposal to Ban Driftnets--The European Community Fisheries Commission has published a proposal to outlaw the use of large-scale driftnets by EC vessels. The proposal requires the approval of EC member states, expected in early 1991. The ban would apply to all driftnets more than 2.5 kilometers long used by any vessel in waters under EC jurisdiction and by EC vessels fishing anywhere in the world. Driftnets less than 2.5 kilometers long will be permitted, but the proposed regulations require that the net remains attached to the vessel if it is longer than 1 kilometer. (NMFS Office of International Affairs, *Weekly Highlights*, December 31, 1990-January 4, 1991)

WESTERN ATLANTIC OCEAN

ICCAT Holds Bluefin Tuna Quota--Because of what is described as the continued "moderate increase" in the harvest of bluefin tuna in the western Atlantic, the member-nations of the International Commission for the Conservation of Atlantic Tunas (ICCAT) decided to hold landings at 2,600 metric tons. That quota has been in effect since 1982. Japan, Canada and the U.S. now share the quota. The most recent statistics show that in 1989 the combined landings in the western Atlantic exceeded the quota by just over 200 mt. Longline landings declined, due to a drop in Japanese production, but harvest by purse seiners remained steady at 385 mt. Landings by U.S. rod-and-reel fishermen increased to 557 mt, and landings by Canadian handliners also increased.

While no management changes were recommended, a change in scientific outlook was made with potentially important implications for management in the future. After reviewing data gathered over the years from tag returns, scientists determined that bluefin likely reach sexual maturity faster than previously thought. As a result, the size groupings have been changed. The large fish category that included fish 10 years old and older now begins with 8-year-old fish. The medium category has changed to 6- and 7-year-old fish, the small fish category stays the same to include fish ages 1 through 5 years. (*National Fisherman*, February 1991)

EASTERN PACIFIC OCEAN

Mexican Tuna Market--Unconfirmed reports suggest that a glut of tuna is developing in Mexico's domestic tuna market. NMFS estimates that about 40 percent of the country's yellowfin and skipjack tuna catch during the late 1980s was marketed domestically. (The remainder of the catch was exported, primarily to Italy.) Tuna companies reportedly experienced

1991 TUNA MEETINGS

(Organizer; meeting type: sci=science, adm=administration)

- MAY 13-15. 2nd World Tuna Trade Conference. Bali, Indonesia. (Infofish)
- MAY 20-23. 42nd Tuna Conference. Lake Arrowhead, CA, U.S.A. (Inter-American Tropical Tuna Commission (IATTC); sci)
- JUN 18-20. IATTC Annual Meeting. Tokyo, Japan. (IATTC; adm)
- JUN 17-21. 4th Standing Committee on Tuna and Billfish and 1st meeting of Yellowfin Tuna Working Group. Port-Vila, Vanuatu. (South Pacific Commission; sci)
- JUL 22-26. 12th North Pacific Albacore Workshop. Shimizu, Japan. (National Research Institute of Far Seas Fisheries; sci)
- OCT 7-12. Indian Ocean Yellowfin Tuna Workshop. Colombo, Sri Lanka. (Indo-Pacific Tuna Programme; sci)
- OCT 28-NOV 1. International Commission for the Conservation of Atlantic Tunas (ICCAT), Standing Committee on Research and Statistics meeting. Madrid, Spain. (ICCAT; sci)
- NOV 11-15. ICCAT Commission Meeting. Madrid, Spain. (ICCAT; adm)

difficulties in the domestic market in 1990 for several reasons: (1) Exporters encountered difficulties in exporting to the Italian market and as a result more tuna was canned for the domestic market. Canners processed about 70,000 mt of tuna products in 1990, but the Mexican consumption was only about 60,000 mt. (2) The brief U.S. embargo in 1990 and the possibility of future embargoes have created an element of uncertainty in the industry. (3) Promotional campaigns to increase domestic consumption were not as effective in 1990 as they were in 1989. (4) Competing foreign canners (primarily Thai and Spanish) are penetrating the Mexican market with inexpensive packs. Mexican 1990 import data are not yet available, but knowledgeable sources indicate that tuna imports were substantially higher than the 900 mt imported in 1989. (5) Consumers are confused by the wide diversity of brand names. Mexican companies market nearly 25 different brands of tuna in oil and several additional brands in other product forms. The appearance of foreign brands further confuses the situation. (NMFS Office of International Affairs, *Weekly Highlights*, January 28-February 1, 1991)

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